Science Glossary

**Physics - P1**

Science Glossary

Physics Unit 1.1 – **Energy Transfer by Heating.**

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| **Key Word** | **Definition** |
| Absorbers | Take in; for example when energy of radiation is absorbed by matter. |
| Condenses | When a gas turns into a liquid |
| Conductors | Transmission of temperature changes through a material (usually a solid) by transfer of vibration from particles to their neighbours, or of electricity. |
| Convection Currents | Circulating currents that form when a fluid is heated or cooled in one area, for example when the air in a room is heated by a fire or a radiator. |
| Density | Having a high mass in a small volume. Density is mass divided by volume. |
| Emits | Give out, for example when light is emitted by a light bulb. |
| Emitters | Giving out; for example an infra-red lamp is an emitter of heat via radiation |
| Energy Transfer | Energy is transferred from one store to another; for example energy stored chemically in a hand-warmer can be transferred into energy stored in the atmosphere as heat. |
| Evaporates | When a liquid turns into a gas and this happens randomly, e.g. a puddle evaporates. |
| Fluids | Any substance that can flow: liquids and gases are fluids. |
| Free Electrons | An electron in a metal that is free to move and thus to carry current or transfer energy. |
| Infrared Radiation (IR) | Electromagnetic radiation that we can feel as heat. IR has a longer wavelength than visible light, but a shorter wavelength than microwaves. |
| Insulators | A thermal insulator acts as a barrier to the transfer of energy by heating, or to the conduction of electricity. |
| Payback Time | The time it takes to recoup in savings the money spent on reducing energy consumption.  Payback time = cost of installation/annual savings |
| Reflectors | Waves are reflected when they bounce off a surface, for example light bouncing off a mirror. |
| Specific Heat Capacity | The amount of heat needed to raise the temperature of 1g of a substance by 1°C |

Physics Unit 1.2 – **Using Energy.**

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| **Key Word** | **Definition** |
| Chemical Energy | Energy stored in the chemical bonds of compounds, such as those in the cells of living organisms or fossil fuels. |
| Conservation of Energy | The principle that energy cannot be created or destroyed; it can only be transferred usefully, stored or dissipated (wasted). The total amount of energy does not change. |
| Efficiency | The proportion of energy supplied to a device that is transformed usefully rather than wasted. |
| Elastic Potential Energy | Also called strain energy; the energy stored in an elastic object because of its shape when it is stretched or squashed. |
| Electrical Energy | Electrons carrying a current through a wire. Electrical energy is used by appliances in order to work. |
| Gravitational Potential Energy | The energy stored in an object because of its height above ground. |
| Joules (J) | The unit for energy |
| Kinetic Energy | The energy an object has because it is moving. |
| Newtons (N) | The unit for measuring force |
| Sankey Diagram | A type of flow diagram showing the energy transfers in a given process. In the diagram the width of the arrows is proportional to the amount of energy transferred. |
| Useful Energy | The energy which is transferred into the intended form for the use required |
| Wasted Energy | The energy transferred into a non-intended form which cannot be used, this is often as heat which gets transferred to the surrounding. |

Physics Unit 1.3 – **Electrical Energy.**

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| **Key Word** | **Definition** |
| Electrical Appliance(s) | Something which converts electrical energy into a form or forms of useful energy, e.g. an iron turned electrical energy into heat energy. |
| Electricity Meter | A device which measures the units of electricity used in a house. |
| Kilowatt (kW) | A measure of power often used for electrical devices. 1kW = 1000W. |
| Kilowatt-hour (kWh) | A unit of measurement for electrical energy. 1kWh=36 megajoules (3,600,000 J). |
| Power | The amount of energy transferred per second; measured in watts (W). |
| Watt (W) | The unit for measuring power. 1 watt = 1 joule per second. |

Physics Unit 1.4 – **Fuel for Electricity.**

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| **Key Word** | **Definition** |
| Atomic Nucleus | The centre of the atom, it contains the protons and neutrons. When split in nuclear fission it releases energy. |
| Biofuel | A fuel made from living sources such as plant matter. |
| Carbon Capture and Storage (CCS) | Techniques for removing carbon dioxide from exhaust gases and preventing it reaching the atmosphere; intended to reduce global warming. |
| Generator | Huge coils of wire and magnets which turn kinetic energy into electrical energy |
| Geothermal Energy | Energy for electricity generation by means of steam heated by hot underground rocks. |
| National Grid | The systems of cables and transformers that transfer electricity all over the country. |
| Nuclear Fission | A reaction in which a large, unstable atomic nucleus splits into smaller nuclei, releasing energy. |
| Renewable resource | A resource is renewable if it can be replaced once it has been used; for example, solar energy is renewable because sunlight can be used to generate electricity without reducing the amount of sunlight available in the future. |
| Solar Cell(s) | Turn light energy into electrical energy and are often placed on roof tops. |
| Step-down Transformers | An electrical component that decreases voltage (potential difference) and increases current of an a.c supply. |
| Step-up Transformer | An electrical component that increases voltage (potential difference) and decreases current of an a,c supply. |
| Transformers | A component consisting of two coils on an iron ore, which changes the potential difference of an alternating electricity supply. |
| Turbine | This is spun around by steam and is attached to the generator in a power station. |

Physics Unit 1.5 – **Waves.**

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| **Key Word** | **Definition** |
| Amplitude | The maximum displacement of a particle as a wave passes; half the height of the wave. |
| Angle of Incidence | The angle between the normal and the incident ray, or wave direction. |
| Angle of Reflection | The angle between the normal and the reflected ray, or wave direction. |
| Boundary | A change in density, e.g. in the body between bone and soft tissue |
| Compressions | Squashing of a substance, for example where the particles are close together in a longitudinal wave. |
| Diffraction | The spreading out of waves after they pass through a narrow gap or around an obstacle; this effect is most noticeable when the gap is the same size as the wavelength of the wave. |
| Echo | The repetition of a sound produced when the sound is reflected back form a surface. |
| Electromagnetic Waves | A form of energy transfer. Electromagnetic waves include x-rays, radio waves, light and infrared radiation. They travel at the speed of light and can travel through a vacuum. |
| Frequency | The number of times per second that something happens, for example the number of complete waves per second or complete swings of a pendulum per second; measures in hertz (Hz). |
| Hertz | A unit of frequency, the number of cycles per second. |
| Longitudinal Waves | A wave in which the oscillations are parallel to the direction of energy transfer. |
| Mechanical Waves | A wave in matter such as a water wave. Any waves other than sound or electromagnetic waves. |
| Normal | An imaginary line which is drawn at 90ᵒ to either the mirror or glass block. |
| Perpendicular | At right angles/90ᵒ |
| Pitch | How high or low a note sounds; pitch is related to the frequency of the sound wave. |
| Plane Mirror | A flat mirror |
| Rarefactions | Spreading out of material or particles as a longitudinal waves passes through it. |
| Real Image | An image through which light rays pass, so that it can be seen on a screen placed at that point. |
| Refraction | The change in direction of a wave as it goes from one material into a different material because of the change in speed of the wave. |
| Speed | Distance covered in a specific time.  Equation: wavelength x frequency |
| Transverse Waves | A wave in which the oscillations are perpendicular to the direction of energy transfer. |
| Virtual Image | An image that light rays do not pass through; they only appear to come from the image. It cannot be projected onto a screen. |
| Wavelength | The length of one complete wave from any point to the point where it repeats, for example from one wave crest to the next. |

Physics Unit 1.6 – **Electromagnetic** **Waves.**

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| **Key Word** | **Definition** |
| Big Bang Theory | The theory that the entire Universe originated in a huge explosion from a single point about 14 million years ago. |
| Red shift | A decrease in wavelength shown by stars moving towards us. |
| Cosmic Microwave Background Radiation (CMBR) | Radiation spread throughout the Universe from an early age of its existence. It is the leftover heat from the big bang. |
| Doppler Effect | A change in the wavelength (and frequency) of a wave caused by relative movement of the wave source and the observer. |
| Electromagnetic Spectrum | The range of frequencies or wavelengths that electromagnetic radiation can have, from radio waves through to x-rays and gamma rays. Visible light is only one part of the electromagnetic spectrum. |
| Red shift | An increase in wavelength shown by stars moving away from us. |
| Wave Speed | How far a wave travels in a certain time.  Frequency x wavelength |